

Inventors: Warren et al.  
Serial Number 09/840,235

PATENT APPLICATION  
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**Amendments to the Claims**

This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1-23 (now cancelled).

24. (new) An image processing apparatus for processing imaging data in a plurality of spectral bands and fusing the data into a color image, comprising:

two or more imaging sensors;

at least two image-acquiring sensor areas located on said one or more imaging sensors, wherein each said sensor area is sensitive to a different spectral band than at least one other of said sensor areas and generates an image output representative of an acquired image in the spectral band to which the sensor area is sensitive;

a frame grabber connected to said imaging sensors

a general purpose computer connected to said imaging sensors for executing in real time

a registration algorithm for scaling and registering said image outputs executed ;

and

a color fusion algorithm for combining said image outputs into a single image.

25. (new) The apparatus of claim 24, further comprising a screen display.

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26. (new) The apparatus of claim 25, further comprising an operator interface for allowing operator input in processing of said image outputs.

27. (new) The apparatus of claim 24, wherein said color fusion algorithm is simple color fusion.

28. (new) The apparatus of claim 24, wherein said color fusion algorithm is based on principle component color fusion.

29. (new) The apparatus of claim 28, wherein said principle component color fusion de-saturates said fused output image.

30. (new) The apparatus of claim 24, further comprising one or more additional sensors on which some of said plurality of imaging sensor areas are located.

31. (new) The apparatus of claim 24, wherein said sensors comprise three sensors, and each said sensor is configured to map its image to an associated color channel, and wherein said algorithm is configured to combine said color channels into a color image.

32. (new) The apparatus as in claim 31, wherein said three sensors are respectively sensitive to any combination of visible, near infrared (NIR), short-wave infrared (SWIR), mid-wave infrared (MWIR), long-wave infrared (LWIR) spectral bands.

33. (new) A method for producing a real-time color fused image, comprising the steps of:  
providing one or more imaging sensors including at least two image-acquiring sensor areas located on said one or more imaging sensors, wherein each said sensor area is sensitive to a different spectral band than at least one other of said sensor areas;

exposing said at least two sensor-areas to an image, said at least two sensor areas thereby each acquiring said image and generating and generating an image output representative of said acquired image in the spectral band to which the sensor area is sensitive;

providing a frame grabber for acquiring said image;

scaling said image outputs of said sensor areas;

providing a computer for executing a color fusion algorithm and a registration algorithm;

registering said image outputs; and

color fusing said image outputs into a single image.

34. (new) The method as in claim 33, further comprising displaying said image outputs on a screen display.

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35. (new) The method as in claim 34, further comprising providing an operator interface for allowing operator input in processing of said image outputs.
36. (new) The method as in claim 33, wherein said color fusing algorithm is simple color fusion.
37. (new) The method as in claim 33, wherein said color fusing is based on principle component color fusion.
38. (new) The method as in claim 33, wherein said image is acquired by three sensors, each said sensor is configured to map its image to an associated color channel, and wherein said fusing combines said color channels into a color image.
39. (new) The method as in claim 33, wherein said three sensors are respectively sensitive to any combination of visible, near infrared (NIR), short-wave infrared (SWIR), mid-wave infrared (MWIR), long-wave infrared (LWIR) spectral bands.
40. (new) The method as in claim 33, wherein said processing and fusing of said image occurs in real time.